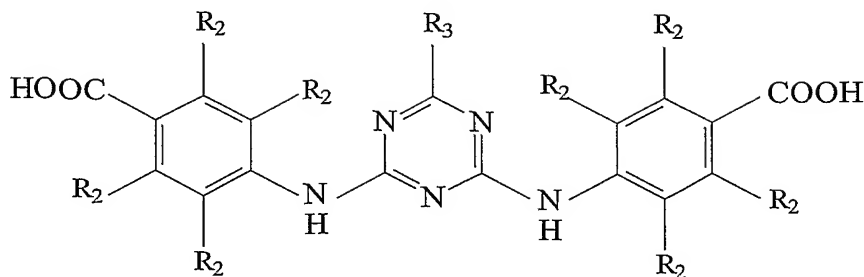
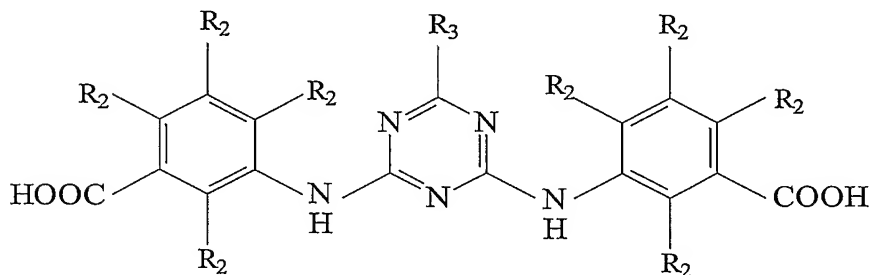


We claim:

1. A composition comprising: a matrix comprising molecules that are non-covalently crosslinked by multi-valent cations, wherein the molecules that are non-covalently crosslinked are non-polymeric, have more than one carboxy functional group, and have at least partial aromatic or heteroaromatic character.
2. A composition for encapsulation and controlled release comprising a composition according to claim 1 wherein the molecules that are non-covalently crosslinked are host molecules and the composition is characterized in that a guest molecule may be encapsulated within the matrix and subsequently released.
3. A composition for encapsulation and controlled release according to claim 2, wherein the host molecule is zwitterionic.
4. A composition for encapsulation and controlled release according to claim 2, further comprising a guest molecule.
5. A composition for encapsulation and controlled release according to claim 4, wherein the guest molecule is a drug.
6. A composition according to claim 1, wherein the molecules that are non-covalently crosslinked are capable of forming either a chromonic M or N phase in aqueous solution before they are in the presence of multi-valent cations.
7. A composition according to claim 1, wherein the molecules that are non-covalently crosslinked have at least partial aromatic character.
8. A composition according to claim 1, wherein at least one of the carboxy groups of the molecules that are non-covalently crosslinked are directly attached to an aromatic or heteroaromatic functional group.
9. A composition according to claim 1, wherein a majority of the multi-valent cations are divalent.
10. A composition according to claim 1, wherein the multi-valent cations are selected from the group consisting of calcium, magnesium, zinc, aluminum, and iron.
11. A composition according to claim 1, wherein the molecules that are non-covalently crosslinked comprise:



or



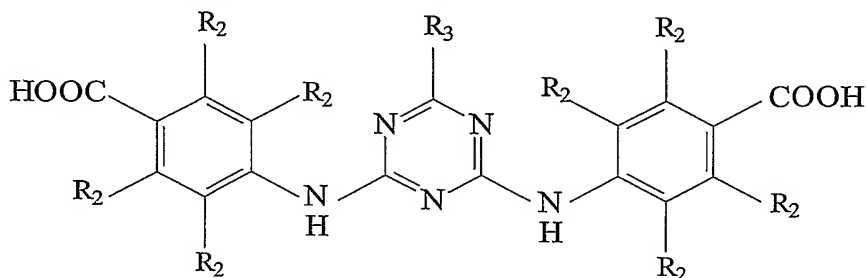
wherein each R_2 is independently selected from any electron donating group, electron withdrawing group and electron neutral group; and

R_3 is selected from the group consisting of substituted and unsubstituted heteroaromatic and heterocyclic rings linked to the triazine group through a nitrogen atom within the ring of R_3 , and proton tautomers and salts thereof.

12. A composition according to claim 11, wherein each R_2 is independently selected from the group consisting of hydrogen, an unsubstituted alkyl group, or an alkyl group substituted with a hydroxy, ether, ester, sulfonate, or halide functional group.
13. A composition according to claim 12, wherein R_3 comprises a heteroaromatic ring derived from the group consisting of pyridine, pyridazine, pyrimidine, pyrazine, imidazole, oxazole, isoxazole, thiazole, oxadiazole, thiadiazole, pyrazole, triazole, triazine, quinoline, and isoquinoline.
14. A composition according to claim 12, wherein R_3 comprises a heteroaromatic ring derived from pyridine or imidazole.
15. A composition according to claim 12, wherein R_3 is selected from the group consisting of pyridinium-1-yl, 4-(dimethylamino)pyridium-1-yl, 3-methylimidazolium-1-yl, 4-(pyrrolidin-1-yl)pyridium-1-yl, 4-isopropylpyridinium-1-yl, 4-[(2-hydroxyethyl)methylamino]pyridinium-1-yl, 4-(3-hydroxypropyl)pyridinium-1-

yl, 4-methylpyridinium-1-yl, quinolinium-1-yl, 4-*tert*-butylpyridinium-1-yl, and 4-(2-sulfoethyl)pyridinium-1-yl.

16. A composition according to claim 11 wherein the host molecule comprises:



and proton tautomers and salts thereof.

17. A composition according to claim 16, wherein each R₂ is independently selected from the group consisting of hydrogen, an unsubstituted alkyl group, or an alkyl group substituted with a hydroxy, ether, ester, sulfonate, or halide functional group.

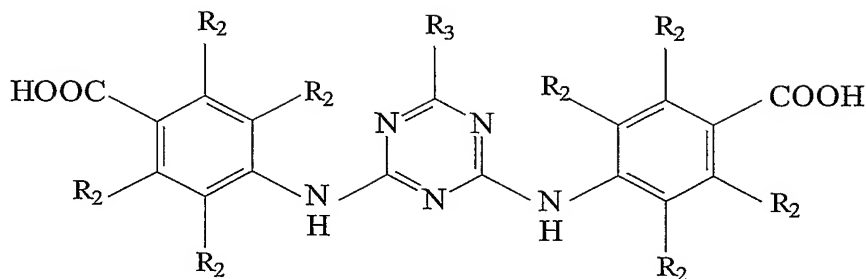
18. A composition according to claim 17, wherein R₃ comprises a heteroaromatic ring derived from the group consisting of pyridine, pyridazine, pyrimidine, pyrazine, imidazole, oxazole, isoxazole, thiazole, oxadiazole, thiadiazole, pyrazole, triazole, triazine, quinoline, and isoquinoline.

19. A composition according to claim 17, wherein R₃ comprises a heteroaromatic ring derived from pyridine or imidazole.

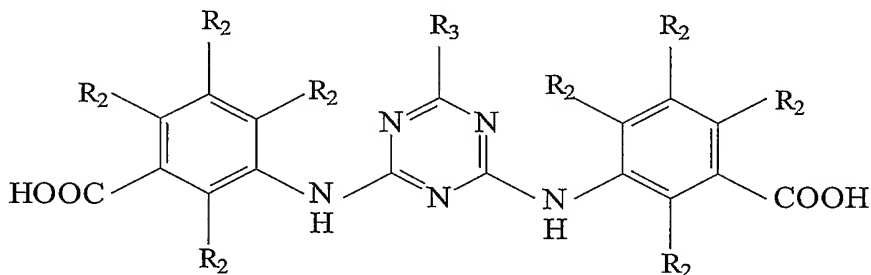
20. A composition according to claim 17, wherein R₃ is selected from the group consisting of pyridinium-1-yl, 4-(dimethylamino)pyridium-1-yl, 3-methylimidazolium-1-yl, 4-(pyrrolidin-1-yl)pyridium-1-yl, 4-isopropylpyridinium-1-yl, 4-[(2-hydroxyethyl)methylamino]pyridinium-1-yl, 4-(3-hydroxypropyl)pyridinium-1-yl, 4-methylpyridinium-1-yl, quinolinium-1-yl, 4-*tert*-butylpyridinium-1-yl, and 4-(2-sulfoethyl)pyridinium-1-yl.

21. A particulate composition comprising particles comprising a water-insoluble matrix comprising a host molecule that is non-covalently crosslinked by multi-valent cations, wherein the host molecule is non-polymeric, has more than one carboxy functional group, and has at least partial aromatic or heteroaromatic character, and the particles are characterized in that a guest molecule may be encapsulated within the matrix and subsequently released.

22. A particulate composition according to claim 21, wherein the particles are dissolvable in an aqueous solution of univalent cations.
23. A particulate composition according to claim 21, wherein the particles do not substantially dissolve in a solution with a pH less than about 5.0.
- 5 24. A particulate composition according to claim 21, wherein the mass median diameter of the particles is less than 100 μm .
25. A particulate composition according to claim 21, wherein the host molecule is zwitterionic.
- 10 26. A particulate composition according to claim 21, wherein the host molecule has two carboxy functional groups.
27. A particulate composition according to claim 21, further comprising a guest molecule.
28. A particulate composition according to claim 27, wherein the guest molecule is a drug.
- 15 29. A particulate composition according to claim 21, wherein the host molecule is capable of forming either a chromonic M or N phase in aqueous solution before it is in the presence of multi-valent cations.
30. A particulate composition according to claim 21, wherein the host molecule has at least partial aromatic character.
- 20 31. A particulate composition according to claim 21, wherein at least one of the carboxy groups of the host molecule is directly attached to an aromatic or heteroaromatic functional group.
32. A particulate composition according to claim 21, wherein a majority of the multi-valent cations are divalent.
- 25 33. A particulate composition according to claim 21, wherein the multi-valent cations are selected from the group consisting of calcium, magnesium, zinc, aluminum, and iron.
34. A particulate composition according to claim 21, wherein the host molecule comprises:



or



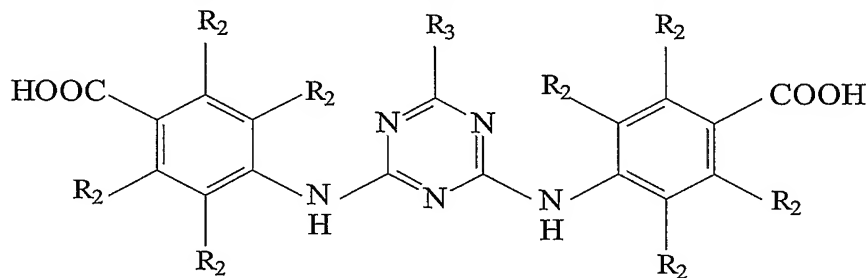
wherein each R_2 is independently selected from any electron donating group, electron withdrawing group and electron neutral group; and

R_3 is selected from the group consisting of substituted and unsubstituted heteroaromatic and heterocyclic rings linked to the triazine group through a nitrogen atom within the ring of R_3 , and proton tautomers and salts thereof.

35. A particulate composition according to claim 34, wherein each R_2 is independently selected from the group consisting of hydrogen, an unsubstituted alkyl group, or an alkyl group substituted with a hydroxy, ether, ester, sulfonate, or halide functional group.
36. A particulate composition according to claim 35, wherein R_3 comprises a heteroaromatic ring derived from the group consisting of pyridine, pyridazine, pyrimidine, pyrazine, imidazole, oxazole, isoxazole, thiazole, oxadiazole, thiadiazole, pyrazole, triazole, triazine, quinoline, and isoquinoline.
37. A particulate composition according to claim 35, wherein R_3 comprises a heteroaromatic ring derived from pyridine or imidazole.
38. A particulate composition according to claim 35, wherein R_3 is selected from the group consisting of pyridinium-1-yl, 4-(dimethylamino)pyridinium-1-yl, 3-methylimidazolium-1-yl, 4-(pyrrolidin-1-yl)pyridinium-1-yl, 4-isopropylpyridinium-1-yl, 4-[(2-hydroxyethyl)methylamino]pyridinium-1-yl, 4-(3-hydroxypropyl)pyridinium-

1-yl, 4-methylpyridinium-1-yl, quinolinium-1-yl, 4-*tert*-butylpyridinium-1-yl, and 4-(2-sulfoethyl)pyridinium-1-yl.

39. A particulate composition according to claim 34 wherein the host molecule comprises:



and proton tautomers and salts thereof.

40. A particulate composition according to claim 39, wherein each R₂ is independently selected from the group consisting of hydrogen, an unsubstituted alkyl group, or an alkyl group substituted with a hydroxy, ether, ester, sulfonate, or halide functional group.

41. A particulate composition according to claim 40, wherein R₃ comprises a heteroaromatic ring derived from the group consisting of pyridine, pyridazine, pyrimidine, pyrazine, imidazole, oxazole, isoxazole, thiazole, oxadiazole, thiadiazole, pyrazole, triazole, triazine, quinoline, and isoquinoline.

42. A particulate composition according to claim 40, wherein R₃ comprises a heteroaromatic ring derived from pyridine or imidazole.

43. A particulate composition according to claim 40, wherein R₃ is selected from the group consisting of pyridinium-1-yl, 4-(dimethylamino)pyridinium-1-yl, 3-methylimidazolium-1-yl, 4-(pyrrolidin-1-yl)pyridinium-1-yl, 4-isopropylpyridinium-1-yl, 4-[(2-hydroxyethyl)methylamino]pyridinium-1-yl, 4-(3-hydroxypropyl)pyridinium-1-yl, 4-methylpyridinium-1-yl, quinolinium-1-yl, 4-*tert*-butylpyridinium-1-yl, and 4-(2-sulfoethyl)pyridinium-1-yl.

44. A medicinal suspension formulation comprising a particulate composition according to claim 21 and a liquid.

45. A method for preparing a composition for encapsulation and controlled release comprising:

(a) combining an aqueous solution and an at least partially aromatic or heteroaromatic compound comprising more than one carboxy functional group to form a solution having a chromonic phase; and

(b) combining the solution having a chromonic phase with a solution of multi-valent ions to form a precipitated composition.

46. A method for preparing a composition for encapsulation and controlled release according to claim 45, wherein the precipitated composition further comprises a bioactive compound.

47. A method for drug delivery comprising:

(a) providing a composition comprising a water-insoluble matrix comprising:

- (i) a host molecule that is non-covalently crosslinked by multi-valent cations, wherein the host molecule is non-polymeric, has more than one carboxy functional group, and has at least partial aromatic or heteroaromatic character, and
- (ii) a drug encapsulated within the matrix;

(b) delivering the composition to an organism such that it comes into contact with univalent cations and releases the encapsulated drug; and

(c) allowing the released drug to remain in contact with a part of the organism for a period of time sufficient to achieve the desired therapeutic effect.

48. A method for drug delivery according to claim 47, wherein the composition is delivered to an animal orally.

49. A method for drug delivery according to claim 48, wherein encapsulated drug is delivered to the intestine.

50. A method for drug delivery according to claim 47, wherein encapsulated drug is delivered to systemic circulation prior to release.

51. A method for drug delivery according to claim 47, wherein the composition is delivered to an animal via inhalation.

52. A method for drug delivery according to claim 47, wherein the composition is delivered to an animal intravenously or intramuscularly.

53. A method of providing a drug delivery composition for encapsulation and controlled release comprising:

(i) administering a crosslinking agent comprising multi-valent cations;

(ii) administering a host molecule agent comprising a non-polymeric host molecule having more than one carboxy functional group and at least partial aromatic or heteroaromatic character; and

(iii) administering a drug;

wherein the crosslinking agent, and the drug form a non-covalently crosslinked, water-insoluble matrix and the drug is encapsulated within the matrix and subsequently released.

- 5 54. The method of claim 53, wherein at least one of the ingredients is administered independently of the others and the composition subsequently forms at a desired site for delivery.